WHAT IS CLAIMED IS:

1. A method for controlling a switch mode power supply having a cyclically controllable switching cell (SC) with only one inductive element (L) and several outputs that can be selected individually for connection thereto, comprising, for each conduction cycle:

injecting a total power level corresponding to the sum of the individual power levels respectively required by all the outputs (OUTi) during this conduction cycle into the inductive element;

selecting the outputs requiring a non-zero individual power level successively and in a predetermined order that is identical for all conduction cycles; and

producing, at each selected output, the corresponding individual power level.

2. The method according to Claim 1, comprising controlling the switching cell (SC) by pulse-width modulation.

3. The method according to Claim 1, wherein selecting comprises electrically connecting the inductive element (L) when the output is selected, and further including determining a total power by:

determining for each output of an individual error signal (VERROR) resulting from the comparison between the voltage at the output and an individual reference voltage corresponding to the output voltage desired at the said output; and

summing all the individual error signals so as to obtain a summation signal (VERROR0).

4. The method according to Claim 3, wherein injecting is controlled responsive to a comparison between the summation signal and a ramp signal (SRP) reinitialized at the start of each conduction cycle, and wherein selecting is controlled responsive to a comparison between the ramp signal and an auxiliary signal obtained from at least one of the individual error signals.

5. The method according to Claim 4, wherein the number of outputs is equal to two, and selecting includes a memorizing, at the start of the conduction cycle, the results of the comparisons between each individual error signal and the ramp signal, and in that the said auxiliary signal is one of the individual error signals.

6. The method according to Claim 4, wherein the number nb of outputs is greater than two, and selecting includes making nb-2 predetermined partial summations of individual error signals, and memorizing, at the start of the conduction cycle, the results of the comparisons between each individual error signal and the ramp signal and comparisons between each partial summation signal and the ramp signal, and in that the auxiliary signal is one of the individual error signals (PWM1, PWM2, PWM3) or one of the partial summation signals (PWM12).

7. The method according to Claim 1, wherein the switch mode power supply (PWR) is of the step-down type.

8. The method according to Claim 1, wherein the switch mode power supply (PWR) is of the step-up type.

9. The method according to Claim 1, wherein the switch mode power supply (PWR) is both a step-down and a step-up device.

10. The method according to Claim 1, further comprising incorporating the switch mode power supply in a terminal (MT) of a wireless communication system containing a battery and an integrated circuit (IC) incorporating a processor (DSP), such that the switch mode power supply is fed by a battery, supplying a voltage supply to the inputs/outputs of the integrated circuit from one output of the switch mode power supply, and supplying a voltage supply to the processor from another output of the switch mode power supply.

11. A switch mode power supply: comprising:

a switching cell, controllable cyclically by a control system, and including only one inductive element and several individually selectable outputs;

the control system including:

determination means capable, during each conduction cycle, of determining a total power level corresponding to the sum of the individual power levels respectively required by all the outputs during this conduction cycle; and

control means (DCS) capable, during this conduction cycle, of controlling the switching cell so as to inject into the inductive element the said total power, selecting successively and in a predetermined order that is identical for all the cycles the outputs requiring a non-zero individual power level and producing at each selected output the corresponding individual power level.

12. The switch mode power supply according to Claim 11, wherein the control means include a preliminary stage (CMP1-CMP12) capable of delivering pulse signals of modulated width, and a digital control stage (DCS) receiving the pulse signals and generating control signals for the switching cell.

13. The switch mode power supply according to Claim 12, wherein the switching cell includes:

controllable selection means (SM) having an input terminal connected to the inductive element and several output terminals respectively connected to the outputs of the switching cell, and

a capacitor (Ci) associated with each output and having a terminal connected to the corresponding output terminal of the selection means,

wherein the means for determining the total power include for each output an individual amplifier (AMP1, AMP2) having a first input connected to the said terminal of the corresponding capacitor, and a second input receiving an individual reference voltage corresponding to the output voltage desired at the said output, and an output delivering an individual error signal, and a summer (SUM0) the inputs of which are respectively connected to the outputs of the individual amplifiers.

14. The switch mode power supply according to Claim 13, wherein the number of outputs is equal to two, and the control means include a ramp generator (RG) capable of

delivering, during each conduction cycle, a ramp signal reinitialized at the start of each cycle, and wherein the preliminary stage includes:

a main comparator (CMP0) having a first input connected to the output of the summer and a second input connected to the output of the ramp generator, and an output delivering a main pulse control signal, and,

an individual comparator (CMP1, CMP2) associated with each output of the switching cell and having a first input connected to the output of the corresponding individual amplifier and a second input connected to the output of the ramp generator, and an output delivering an individual pulse control signal,

and in that the digital control stage (DCS) controls the injection of the total power into the inductive element during each conduction cycle based on the main pulse control signal, and controls the selection means during this conduction cycle based on one of the individual pulse control signals.

15. The switch mode power supply according to Claim 14, wherein the control stage (DCS) includes a memorizing circuit (MM) capable of memorizing, at the start of the conduction cycle, the values of the individual control signals.

16. The switch mode power supply according to Claim 13, wherein the number nb of outputs is greater than two, and the control means include a ramp generator capable of delivering, during each conduction cycle, a ramp signal reinitialized at the start of each cycle, and the preliminary stage includes:

a main comparator (CMP0) having a first input connected to the output of the summer and a second input connected to the output of the ramp generator, and an output delivering a main pulse control signal,

an individual comparator (CMP1, CMP2, CMP3) associated with each output of the switching cell, and having a first input connected to the output of the corresponding individual amplifier and a second input connected to the output of the ramp generator, and an output delivering an elementary pulse control signal,

nb-2 additional summers (SUM12) capable of carrying out nb-2 predetermined partial summations of the individual error signals delivered by the individual amplification means, and

nb-2 additional comparators (CMP12) connected at their inputs to the outputs of the nb-2 additional summers and to the output of the ramp generator, and delivering, respectively, additional pulse control signals,

wherein the digital control stage (DCS) controls the injection of the total power into the inductive element during each conduction cycle based on the main pulse control signal, and controls the selection means during this conduction cycle based on one of the individual pulse control signals or on one of the additional pulse control signals.

17. The switch mode power supply according to Claim 16, wherein the control stage includes a memorizing circuit (MM) capable of memorizing, at the start of the conduction cycle, the values of the individual pulse control signals and the values of the additional pulse control signals.

18. The switch mode power supply according to Claim 14, wherein the switching cell (SC) includes two switches (SW1, SW2) connected between a power supply voltage, ground and the inductive element, and controlled by the main pulse control signal, and in that the selection means include, for each output, an individual switch (MOSi), connected between the inductive element and the terminal of the corresponding capacitor, and controlled by an individual pulse control signal or by an additional pulse control signal.

19. The switch mode power supply according to Claim 11, wherein it is a step-down device.

20. The switch mode power supply according to Claim 11, wherein it is a step-up device.

21. The switch mode power supply according to Claim 11, wherein it is a step-down and step-up device.

22. A terminal of a wireless communication system which includes a switch mode power supply according to Claim 11.

23. The terminal according to Claim 22, wherein it is a cellular mobile telephone.

24. The terminal according to Claim 22, wherein it includes a battery and an integrated circuit (IC) incorporating a processor, and wherein the switch mode power supply is

fed by the battery, and wherein the regulation voltage of the inputs/outputs of the integrated circuit is the voltage available at one output of the switch mode power supply, and the regulated power supply voltage of the processor is the voltage available at another output of the switch mode power supply.

25. A switched mode power supply, comprising:

a single inductive element;

a first switching device coupled between a first voltage potential and a first terminal of the single inductive element;

a second switching device coupled between a second voltage potential and the first terminal of the single inductive element;

a plurality of outputs;

a output selection circuit that selectively couples a second terminal of the single inductive element to individual ones of the plurality of outputs;

a power measurement circuit that determines power requirements for each output and a total amount of power required by the plurality of outputs; and

a control circuit that drives the first and second switching devices and the output selection circuit to inject the required total amount of power into the single inductive element and selectively couple individual outputs to the single inductive element to deliver their individual output power requirements from the single inductive element.

26. The power supply of claim 25 wherein each of the plurality of outputs has a capacitive element coupled between the output and one of the first and second voltage potentials.

27. The power supply of claim 26 wherein the power measurement circuit includes a voltage sensor circuit coupled to each output.

28. The power supply of claim 27 wherein each voltage sensor circuit further includes a comparison circuit that compares the sensed output voltage to a reference voltage to generate an error signal indicative of individual output power requirement.

29. The power supply of claim 28 wherein the power measurement circuit further includes a summer that sums the error signals to generate a total error signal indicative of the required total amount of power.

30. The power supply of claim 29 wherein the control circuit comprises:

a ramp voltage generator;

comparator circuits for comparing the individual error signals and total error signal against a voltage output from the ramp voltage generator to produce a corresponding plurality of pulse width modulation control signals; and

a circuit responsive to the pulse width modulation control signals to drive the first and second switching devices and the output selection circuit.

31. A switch mode power supply, comprising:

a cyclically controllable switching cell and having only one inductive element and several outputs that can be selected individually;

a power measurement circuit that measures, during each conduction cycle, a total power level corresponding to the sum of the individual power levels respectively required by all the outputs for that conduction cycle;

a control circuit that causes the required total power to be injected into the inductive element, successively selects the outputs requiring a non-zero individual power level, in accordance with a predetermined order, for sufficient length of time to deliver the require individual power level from the inductive element.

32. The power supply according to Claim 31, wherein control circuit controls the switching cell (SC) by pulse-width modulation.

33. The power supply according to Claim 1, wherein each output includes a capacitor coupled between the output and a reference potential, and the power measurement circuit comprises a circuit that determines, for each output, an individual error signal resulting from a comparison of a voltage on the capacitor and an individual reference voltage corresponding to a desired output voltage, and determines a total error signal resulting from a summation of the individual error signals.

34. The power supply according to Claim 33, wherein the control circuit operates responsive to a main pulse signal resulting from a comparison between the total error signal and a ramp signal reinitialized at the start of each conduction cycle to inject power into the inductive element, and further operates responsive to individual pulse signals resulting from comparisons between an auxiliary signal obtained from at least one of the individual error signals and the ramp signal to determine the amount of time each output is selected.

35. The power supply according to Claim 34, wherein the number of outputs is equal to two, and the said auxiliary signal is one of the individual error signals.

36. The power supply according to Claim 34, wherein the number nb of outputs is greater than two, the power measurement circuit further making nb-2 predetermined partial summations of individual error signals, and the auxiliary signal comprising at least one of the partial summations and the individual error signals.